data sheet ORACLE WAREHOUSE MANAGEMENT 11i

Oracle® Warehouse Management (WMS) provides advanced, real time materials management functionality for a variety of business types ranging from discrete or flow manufacturing to distribution, e-commerce and third-party logistics, via wireless mobile RF devices. Oracle WMS automates and optimizes material handling processes to reduce labor costs, improve facility utilization, increase order accuracy and provide innovative services to customers. Leveraging Oracle Mobile Supply Chain Applications (MSCA), Oracle WMS supports warehouse resource management, warehouse configuration, task scheduling, advanced pick methodologies, and value added services. Oracle WMS is part of the Oracle E-Business Suite, an integrated set of applications that are engineered to work together.

Oracle's Integrated Warehouse Execution and Logistics Solution

Oracle WMS is a fully integrated component of Oracle's E-Business Suite. It supports warehouse resource management and configuration, task dispatching, flexible pick methodologies, advanced material handling and control (including license plating), material status, advanced lot and serial control, and the support of highly automated material handling environments.

Oracle WMS has been designed from the ground up to leverage the power of mobile hand-held computers, bar code scanning, process automation and real-time validation to increase the accuracy and efficiency of material handling business processes.

Oracle WMS also supports the definition and execution of these business processes through a flexible and powerful business rules engine, without the need to customize code. Oracle WMS Supports:

- Mobile (RF) devices and Barcoding
- Inbound Logistics
- Outbound Logistics
- Reverse Logistics
- Advanced Inventory, Storage and Facility Management
- Value Added Services

Oracle WMS uses exactly the same data and systems infrastructure as the rest of the E-Business Suite. In effect, Oracle WMS has no data of it's own, instead it transacts directly with the data associated with the other supply chain and financials modules. This "built-in" approach eliminates many of the costs and operational complexities associated with a "bolt-on" warehouse management system and will dramatically accelerate and improve the ROI and overall cost of ownership.

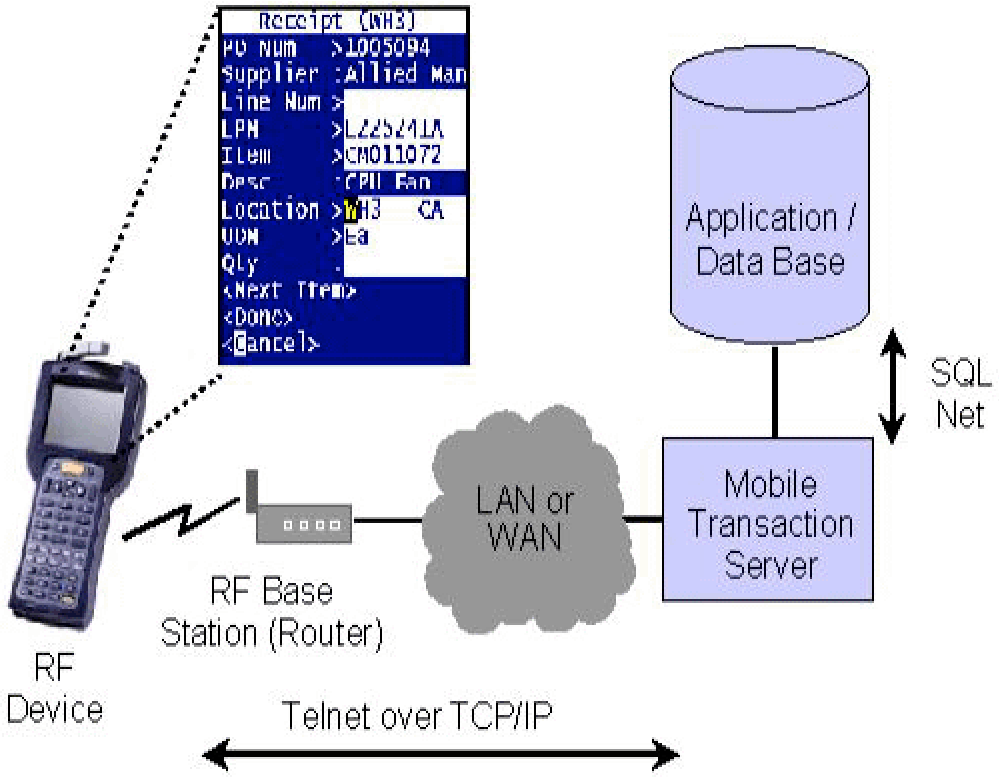
Oracle Mobile Applications

Warehouse Execution systems

Today the demand for accurate, real-time information and the need to increase inventory velocity throughout the supply chain is driving rapid adoption of mobile computing for manufacturing, warehousing, distribution, logistics, transportation and field service. Mobile computers connected via radio frequency (RF) to the network, combined with the use of auto-id techniques such as barcoding, permits actual work performance (e.g. picking an item, counting a location, etc.) to be unified with the recording of that activity in the information system. This "execution system" approach, eliminates sources of error, reduces latency, increases efficiency, and dramatically reduces the complexity of the overall business process.

Oracle Mobile Applications Architecture

Oracle has leveraged standard Internet technologies such as Java, XML, TCP/IP and Telnet to create a device independent technology platform to support these types of applications. In general, these mobile devices will be connected to the network using the radio frequency (RF) standard of 802.11b (11 mbs) and will communicate using TCP/IP. The application logic runs on a Java based middle tier and in the database - eliminating any application code on the device and permitting a wide variety of mobile (RF) devices from multiple vendors to be used, even concurrently. In addition, the application can run on any PC or handheld that can run a standard Telnet client. The architecture also supports all the standard barcode encoding formats, including 2D, and embedded data field identifiers (which permits out of order scanning).



Oracle Mobile Architecture

Mobile User Interface

Typical mobile devices have a small display area, which makes the standard desktop browser interface unsuitable. In addition, the user interface for execution systems needs to be quick to learn and efficient to use - particularly for repetitive transactions. To accommodate these design goals, the mobile user interface has been specifically designed to eliminate all extraneous information and to provide a fast path through the transaction. All fields are real-time validated with appropriate error messages. The display builds dynamically, so the information requested is dependent on the prior information entered (e.g. only ask for a "lot" if the item entered is lot controlled). The user interface also permits the display language to be set dynamically by the user's profile. This means that two users, operating side by side, can be running in different languages.

Advantages of Mobile applications

Oracle Mobile Applications enhance supply chain velocity by:

- Improving information accuracy for supply chain planning and business intelligence applications to optimize production and distribution plans.
- Increasing manufacturing and warehouse user productivity by providing real-time mobile access and automated data collection reducing human errors inherent in manual and paper based systems.
- Providing real-time information for manufacturing and warehouse scheduling to optimize activities and resources.
- Allowing for real-time communication and complete visibility for supply chain collaboration.
- Enhancing throughput and decreasing cycle-time through process automation.

Inbound Logistics

Receiving (ASN and non-ASN)

Receiving the following documents is supported: standard purchase orders, blanket purchase order agreements, internal requisitions, internal organizational transfers, and RMA's. Inbound material can be routed according to three different receipt routing methods: direct (one step receive and deliver), standard (receive and later putaway), or inspection (receive, inspect and later putaway). Supplier ASN's offer a form of collaboration that speeds the receiving process by delivering packing slip data directly to the mobile device.

Receipt Check-in

Incoming material is matched against expected receipts according to receiving tolerances (date, quantity, and ship-to-location). Special instructions are displayed on the mobile RF application and the receiver is notified of any warn-level tolerances that have been exceeded. Data such as lot number, serial number or lot expiration date is captured and associated to a license plate number. The user may use a pre-printed license plate numbers (LPN label, or generate one automatically on the fly with a system generated LPN number. LPNs enable users to perform complex inventory transactions via a single bar code scan, improving efficiency and ensuring data accuracy.

Quality Inspection

Supports both standard Oracle Purchasing inspection and advanced Oracle Quality inspection. Inspection may be required based on supplier, product, or an organization level default. Inspection is performed by scanning the LPN, then indicating the quantities of material that are accepted and rejected. Rejected material is packed into a separate LPN to be differentiated from the accepted material. The mobile RF application displays the inspection information at time of check-in and at the inspection station. Action rules can be set up to notify planners and suppliers if there are any exceptions such as defective material or to launch a material review board process.

Bar Code Printing

Allows the user to print product or packaging labels on demand. The label field prompts are derived dynamically from the database allowing on-site creation of an unlimited number of bar code label formats to aid in the receipt, storage, picking and shipping of product. Oracle WMS interfaces with several certified partners that provide specialized label design and label print servers, enabling customer specific compliance. Through a standardized API, Oracle WMS passes label content data to the third party label print server, the print server can pass status or error messages back to Oracle WMS

Directed Put-Away and Storage Optimization

Provides warehouse personnel with an available storage location or locations for a put-away, matching the material handling constraints and item/inventory attributes using real-time information. Directed put-away minimizes warehouse storage fragmentation, increases storage utilization, reduces stock obsolescence, and increases efficiency of warehouse operations. Oracle WMS determines the optimal storage location based on a set of user configurable rules and strategies

which are stored in the WMS Rules Engine. Typical strategies could be: closest empty slot to pick; fill pick locations first; replenish existing locations based on available space; item cube and weight; etc. When a user chooses a put-away location other than the one suggested, workflow actions may be kicked off to notify managers of discrepancies or schedule cycle counts to correct system inaccuracies.

Opportunistic Cross Docking

Redirects inbound items by checking for backordered product and/or new demand requirements recognized at the time of receipt. If needed, the system will route the product directly from the receiving dock or from manufacturing completion to a staging lane, shipping dock or shop floor. This eliminates the extra material handling associated with placing product into a put-away location and then initiating a picking. As a result, operational costs are reduced and inventory velocity is increased.

Outbound Logistics

Trip and Delivery Planning

Used to establish an instance of a specific freight carrier departing from a particular location containing one or more deliveries. Trips and deliveries can be created automatically or manually. They can be scheduled in advance or created as a result of ship confirmation.

Appointment and Dock Assignment

Permits warehouse managers to schedule outbound carrier appointments, dock doors availability and staging lane usage within the warehouse. Dock scheduling helps ensure optimal usage of dock space based on warehouse resources, delivery times, quantities and check-in priorities thereby resulting in efficient receiving and shipping processes.

Pick Wave Selection

Provides a graphical interface to effectively build a pick wave based on several combinations of selection criteria. Pick wave selection criteria includes: order lines, containers, deliveries, trips, consignee, ship method, ship-to, order revenue value, customer delivery schedules, carrier etc. Selected order lines can be viewed prior to pick release task generation and inventory allocation. Common query criteria can be saved for future use.

Pick Release Task Generation and Inventory Allocation

Sequences and prioritizes pick tasks according to user definable rules such as: pick methodology, work load, pick routing, inventory allocation rules, warehouse topology, packing/consolidation lane capacity. The selection of which inventory is allocated to satisfy a pick is made by using a set of user configurable rules and strategies which are stored in the WMS Rules Engine. These rules establish extremely flexible and powerful inventory allocation criteria which can combine such elements as expiration date, lot control, product grade, order quantity, customer priority, etc.

Pick Methodologies

Groups, and sequences pick tasks for task dispatching. Pick methodologies allow the selection of different pick methods for different order picking needs. Options include: order picking, cluster picking, zone picking, bulk picking, and paper-based/ picking, and pick and pass picking depending on warehouse requirements. Oracle WMS splits or merges tasks based on the pick methodology and the remaining capacity of the user equipment to optimize efficiency of warehouse resources.

Task Dispatching & Directed Picking

Picking tasks are dispatched directly to the user's RF device. These tasks are dispatched based on user defined rules (in the WMS Rules Engine) that match the skills, equipment and proximity of the user to the tasks in the queue. Real-time mobile RF applications enhance resource productivity by directing order selectors to specific pick-from locations and eliminating parallel paper based systems. Oracle WMS supports single zone picking, pick and pass zone picking, field picking across all work areas as well as pick to deplete. Oracle WMS also offers paper based and label picking, as well as supporting user overrides.

Cartonization

Determines container type and size dimensions as well as carton numbers needed during the order fulfillment process. This process is automated by the system during the wave picking process.

Packing

Supports packing during picking or as an independent operation. Can pack containers with multiple levels of nesting. Users can be notified of special packing instructions for an order. On-line inquiries permit the viewing of a container's contents through all levels of container nesting.

Customer Compliance Labeling

Allows printing of customer specific labels using customer compliance labeling rules. Any number of unique formats may be generated for a single warehouse, allowing the warehouse to generate customer specific labels when requested. These labels may be directed to any network configured printer including belted printers. The unlimited number of label types will print to either a local or remote locations based on user or system directions. Oracle WMS provides integration to 3rd party label design and printing systems to support these customer compliance needs.

Shipment Stage/Consolidation and Loading

Shipping occurs after picking tasks have been completed and directed to previously identified dock staging lanes. Oracle WMS allows the user to consolidate multiple partially filled containers/license plates into fewer, optimized containers. Shipment loading occurs after orders have been consolidated by delivery. The container is scanned as it is loaded into the trailer, ensuring that every license plate is accounted for and loaded on the correct trailer.

Shipment Verification and Close

Updates system in real-time based upon what quantities, items, and containers have been picked/loaded and which ones should be deducted from inventory.

Reverse Logistics

Return Material Authorization (RMA) Receiving

Records the inspection and receipt of customer authorized returned items. Receipt items, date, quantity can be verified against RMA.

Supplier Returns

Supports the return of material back to the appropriate supplier from a previously received purchase order or purchase agreement. Quantities returned will be reflected as an inventory issue and purchase order receipt quantity reduction. Credits created by issuing the return will be automatically applied.

Refurbishment and Recycling

Supported via Oracle Service and Depot Repair for those business processes that need advanced reverse logistics and service repair.

Advanced Inventory, Storage and Facility Management

Container Management and License License Plate Numbers (LPN)

Enables users to track the contents of any containers in Receiving, Work in Process, Inventory, Shipping and in-transit inventories. Content information for each container can be transmitted and received via in-bound or out-bound ASN. Containers can be reusable, such as pallets or bins; containers may also be disposable, such as cardboard boxes. The container's genealogy provides a complete content and transaction history of each container license plate. A container's contents may be reserved through Oracle's supply chain reservations capability. LPNs uniquely identify each container in the supply chain. The contents of each container are tracked by this identifier. LPNs are used to store and transact inventory throughout the supply chain and may be individually transacted through its packed/unpacked, reservation and shipment sealing processing. Multi-level nesting enables containers to be packed within another container to any level of nesting. Thus inner item packaging may be tracked as it is loaded onto pallets and subsequently into shipping containers.

Automated Replenishment

Provides both inventory and MRP replenishment planning, dynamic (order demand or activity) replenishment and replenishment direct from receiving. Material can be sourced from within the warehouse, from a different warehouse or an external supplier.

Serial Number Genealogy/Tracking

Records the history of any serial controlled item throughout the product lifecycle including purchase receipt, manufacturing, order fulfillment, to service. The user may trace either up or down starting at any point in the genealogy chain.

Advanced Lot Control

Enables user-configurable lot attributes including grade, purity, potency, moisture content, style, color, size. Configurable dates allow users to define aging/maturity, quarantine, QC hold and other time fences appropriate for their materials with built in user definable intelligence to enable or prevent specific material transactions while within the time fence. Users can define picking/allocation rules, view inventory balances, and plan by these lot attributes.

Advanced Lot/Sublot Control

Includes support for sublots. Sublots are lots within lots. Multiple levels of parent/child lot relationships will enable all functionality available to lots to be available for sublots. Lots/sublots may be indivisible to ensure that a supply to production or a single customer is all from a single source lot.

Material Status Control

Indicates the eligibility of materials for various transactions. Material may be on hold for quality inspection, curing, or other event. These statuses may apply to all items within a location or specific lot or serial numbers. Users may query items by status, view statuses as part of the on hand balance inquiry and can be prevented from using items improperly.

Zone Configuration

Provides the user with the ability to configure separate physical / logical areas within the warehouse for different users.

- Picking: Single zone or multiple pick and pass zones.
- Storage: Put-away by product; UOM; category.
- Sizing: Floor locations and bulk storage, linked to primary, secondary, overflow, hazardous and high-value logic, pallet locations, and shipping needs.

Locator Structure

Uses Oracle flexfield technology to define the warehouse locator structures for a single facility. This provides extensive flexibility in defining a physical warehouse design because the number of locators and format values are user configurable.

WMS Control Board

Assists the warehouse manager in monitoring and running the distribution center. The WMS Control Board allows the user to manage the work tasks within the warehouse by activity type and resource. The graphical interface displays tasks and activities in a variety of user-defined selectable formats from line and bar graphs. This tool provides warehouse management with a real-time snapshot of the work progress across the multiple areas of the warehouse, allowing the warehouse

manager to flex his workforce to a needed area if one activity is lagging behind others. The WMS Control Board monitors a wave's progress, replenishment, picking, packing, consolidation, loading, and shipping statuses. Warehouse productivity and efficiency increases due to reduced staffing levels and increased inventory fulfillment rates. The WMS Control Board also informs management when activities are completed, i.e., trucks loaded, high priority orders picked, hot items received, etc.

Kanban Management

Supports both internal and external supplier kanbans, which streamlines the flow of products across the supply chain and through the warehouse. The system provides great flexibility in making replenishment choices and implementing Flow Manufacturing.

Task Dispatching

Directs warehouse personnel to required task assignments, warehouse zone locations and the equipment needed to complete the assigned task. As tasks are performed, the system captures real-time task data (initiation and completion information) for later labor and productivity reporting. Oracle WMS supports task management for sales order picks, WIP component picks, cycle counting and put away from receiving and manufacturing.

Inter-Organization Transfers

Facilitates transfer of goods between two organizations (from one organization to another i.e. manufacturing plant, warehouse, etc.) offering a user the Inventory based transfer and Internal Requisition mechanism.

Cycle Counting/Physical Inventory

Provides for multiple user definable count criteria by item, location, pick frequency, number of days, discrepancy, expected receipt, etc. Full physical inventory (PI) capabilities for startups and audited PIs are available depending on a client's needs. All cycle count selection criteria is available for PIs. Cycle counts can be directed/dispatched by the system.

Date Coding and Shelf Life Monitoring

Minimizes the amount of material scrapped due to improper material rotations. Using the FEFO and FIFO options, the system ensures that product consumed by manufacturing or used in order fulfillment are selected with sufficient active life remaining on them. Material is picked based on proper rotations through user configurable business rules maintained by the WMS Rules Engine.

Hazardous Material Control and Handling

Allows the user to configure handling rules and track hazardous materials across the supply chain from supplier to customer and back if necessary. A hazard status may be associated with either an item or a stock locator. Information associated with the item such as handling instructions are available during the receipt and picking processes. Business rules configured for use in directed picking or directed put away ensure the proper storage, selection and co-mingling of hazardous materials.

Active Alerts and Notification Messaging

Improve the efficiency of business operations by configuring real-time alerts and workflow-based notifications of supply chain events. For example, the user may configure an alert that notifies personnel of material shortage conditions.

ABC Classification and Analysis

Classify and analyze items in the warehouse based on multiple rules such as item pick frequency by pick UOM or inventory value.

Web-based Warehouse Reporting

Provide both operational performance and analytical information needs. Reports can be customized with Oracle Reports. Examples of standard reports include: ABC analysis and historical demand reporting by a variety of user configurable parameters (i.e. pick UOM, pick frequency, item, etc.), labor management and productivity reporting, wave, task, storage, QC, shipping reporting, and mobile RF application audit trails by resource.

Inventory Ownership Tracking

Ownership tracking is an increasingly important dimension of inventory visibility. Companies holding inventory on their premises now have visibility to the ownership of that inventory through the introduction of Cost Groups. A separate cost group is warranted whenever an item has a different account coding. A company may demand that inventory ownership transfer based upon the consumption of the material. As such, a supplier's warehouse inventory can be identified, tracked, and properly costed while co-mingling actively with company owned inventory. This helps reduce higher inventory levels, while promoting higher inventory turns.

Mobile real-time Item Inquiry

Real time inquiries are available from the mobile devices for:

- Item
- License Plate
- Material Status

Integration to 3rd Party material Handling Systems

Available using public API's:

- Storage and Retrieval Systems
- Carousels Automated
- Conveyors
- Automated Guided Vehicles (AGV)

Value Added Services (VAS)

Kitting/Dekitting

Multi-level bill of material functionality is available. Supports pick-to-order kitting as well as pre-built kits. Assembly warehouse activities are supported and are client configurable and transactable from mobile RF applications.

Mixed-mode Manufacturing

Supports assemble to order (ATO), project-based/engineer to order (ETO), Discrete and Repetitive/Flow environments concurrently. Oracle manufacturing supports a comprehensive choice of manufacturing methods while providing the flexibility to combine multiple methods concurrently. This enables companies to implement a low risk transition from traditional make to stock discrete manufacturing/VAS methods to assemble to order and flow manufacturing techniques. Mobile RF manufacturing applications support several manufacturing transactions including:

- WIP job/schedule completions
- Work order-less completions
- Flow manufacturing completions
- WIP move transactions
- WIP material transactions
- WIP scrap transactions
- WIP return transactions
- Backflush transactions
- Kanban transactions
- View item specifications

Bills of Material and Engineering Change Orders

Help the user manage all essential engineering, business planning, sales order configuration, material planning, and material handling information. The user can keep revisions up to date, forecast demand for product families, accurately plan material and resource requirements, and specify automated material-handling transactions using simple replenishment and back flush techniques. Cost accountants can also simulate, plan, and analyze costs for items and their substitutes.

Product Compliance Labeling

Allows printing of product specific labels based on product compliance labeling rules. Any number of unique label formats may be generated allowing the warehouse to generate hazardous material and customer specific labels when requested. Labels may be directed to any network configured printer. Oracle WMS provides integration to 3rd party label design and printing systems.

Outsource Processing

With Oracle Work in Process defines outside processing resources and assign them to operations on routings. Assemblies can be moved to these outside operations and receive them back based on the routings. Oracle Work in Process automatically charges resources for outside processing, correctly tracks vendor costs, and directly interfaces with Oracle Purchasing to automate the purchase and payment process. Oracle Work in Process includes vendor supplied components and resources within the manufacturing process. Users can take advantage of specialized vendor skills to help lower engineering and manufacturing costs and increase production quality. Users can also leverage vendor capacity to temporarily or permanently increase the overall production capacity.

VAS/Manufacturing Quality Inspections

Oracle WMS supports manufacturing quality inspections at work order completion time using specified quality collection plans supporting. The system automatically generates material movement transactions to move an item to the quality control inspection area from manufacturing based on configurable options. The manufacturing QC inspection may be initiated based on job number, final assembly item, or an operation. The mobile Manufacturing & Quality application dynamically displays the inspection information at time of work order completion. Users will not only be able to determine the quality parameters that need to be entered, but also access any required specifications using the mobile RF device.

Oracle E-Business Suite—The Complete Solution

Oracle E-Business Suite enables companies to efficiently manage customer processes, manufacture products, ship orders, collect payments, and more—all from applications that are built on a unified information architecture. This information architecture provides a single definition of your customers, suppliers, employees, products—all aspects of your business. Whether you implement one module or the entire Suite, Oracle E-Business Suite enables you to share unified information across the enterprise so you can make smarter decisions with better information.

KEY FEATURES

- Mobile (RF) and Barcoding support
- Flexible Rules Based Business Logic
- Inbound Processes (non-ASN, ASN, Inspection of Supplier Shipments, Internal Transfers and Customer Returns)
- Outbound Processes (Pick, Pack, Ship, Dock Assignment)
- License Plate Control and Container Management with Nesting and ASN Integration
- Directed Picking, Put Away and Replenishment
- Automated Task Dispatching and Task Management
- Advanced Pick Methodologies including Bulk and Pick & Pass Picking
- Workflow Based Corrective Actions
- Cartonization & Consolidation
- Customer Compliance Labeling
- Opportunistic Cross Docking
- Advanced Lot and Serial Control and Genealogy
- Material Status Tracking and Control
- Advanced Material Ownership Tracking and Costing Independent of Physical Location
- Management of Finished Goods, Raw Materials, and Intermediate Assemblies
- Cycle Counting & Physical Inventory
- Value Added Services (ATO, PTO, Assembly, Kitting, Flow Manufacturing)
- Integration Kit to Material Handling Systems
- Real-time or Background Transaction Processing
- Field Level Validation
- Integration to Material Handling Equipment
- Pick and Putaway Support for Manufacturing Facilities

Major Benefits

- Elimination of WMS integration issues
- Increased Mobility and Flexibility
- Real-time Inventory Information
- Duplicate Data Entry Eliminated
- Reduced Data Entry Errors
- Increased Productivity and Reducing Costs
- Increased Inventory Accuracy

Business Benefits

- Reduces implementation complexity by built in integration to the E-Business Suite.
- Improves operational productivity and reduces costs through process automation, storage optimization, automated task dispatching, cross docking, etc.
- Increases accuracy through barcode scanning, real-time validation, tracking by License Plate Numbers, etc.
- Adapts to changing business needs by modeling business processes through user-defined rules, without additional coding
- Hardware / Software independent architecture.

Oracle Corporation
World Headquarters
500 Oracle Parkway
Redwood Shores, CA 94065
USA

Worldwide Inquiries:
650.506.7000
Fax: 650.506.7200
http://www.oracle.com

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Features and screen shots shown may not correspond exactly to the released product.